



IES Newsletter

Volume 17, Number 2
March - April 2000

Director's Note

Over time, the plants, animals and microbes in an ecosystem develop a complex set of interrelationships. Natural disturbance, for example fire or windstorm, can cause changes in these relationships. IES scientists study such changes and the subsequent recovery processes. Our ecologists also measure the effects to an ecosystem of human-caused disturbances, including the invasion of non-native species. Alien invasions may have positive, neutral or negative effects on ecosystem structure and function. The zebra mussel, for example, was introduced accidentally to Lake St. Clair in the Great Lakes in 1985 when a European cargo ship discharged its ballast water; it has since spread to freshwater bodies across the country with consequences such as those described in the last issue of the IES newsletter. Other out-of-control invaders include the gypsy moth, the European starling, purple loosestrife and the hemlock wooly adelgid.

Beech bark disease is caused by yet another invader, the beech scale insect. Beech trees in the Catskill Mountains are dying from its effects, and this is causing significant changes in the forest ecosystem. Dr. Mary Arthur, whose research is profiled here, is collaborating with IES ecologists to learn more about the effects of these changes in the Catskill ecosystems.

The *IES Newsletter* is published by the Institute of Ecosystem Studies, located at the Mary Flagler Cary Arboretum in Millbrook, New York.

Director: Gene E. Likens
Administrator: Joseph S. Warner
Head of Education: Alan R. Berkowitz
Newsletter editor: Jill Cadwallader

Address newsletter correspondence to the editor at:

Institute of Ecosystem Studies
Education Program, Box R
Millbrook NY 12545-0178
e-mail: Cadwalladerj@ecostudies.org

Printing: Central Press, Millbrook, N.Y.

University of Kentucky Shares Its Scientists with IES

Mary Arthur: Does Beech-to-Sugar Maple Shift Change How the Ecosystem Works?

Carried by wind and wildlife, the beech scale insect has spread from Nova Scotia, site of its accidental introduction a century ago. Its range now includes not only parts of Canada but also New England, New York and much of New Jersey and Pennsylvania, and is extending west and south. The insect, which when full-grown measures no more than 0.8 mm (1/30th in.), feeds by inserting its needle-like mouthpart into the bark of a living beech tree and sucking sugars and other nutrients from the underlying tissue. This parasitic activity does not kill the tree. It does, however, provide a port of entry for a fungus that forms cankers. When the cankers expand, join together and girdle the tree, the beech dies.

Beech bark disease, as the scale-fungus relationship is called, started moving through the Catskill Mountains between 1940 and 1960. Probably because of the way the scale insect is transported, degrees of infection have varied greatly, from places where beech are almost untouched to areas where the population has been devastated. Sugar maple trees are co-dominant in beech forests, and in those areas where beech bark disease has had its greatest effects they have become dominant. This community shift, it appears, is leading to changes in ecosystem function in Catskill Mountain forests and is the subject of a new National Science Foundation funded project, led by Drs. Gary Lovett and

Kathleen Weathers of IES, Mary Arthur (University of Kentucky) and Margaret Carreiro* (Fordham University).

Dr. Arthur (below left), who collaborated with Drs. Lovett and Weathers on an earlier phase of this Catskill Mountain ecosystems project, is currently on sabbatical at the Institute. The previous study began in 1996 and focused on how forest composition and nitrogen deposition from the atmosphere may affect levels of nitrate in Catskill streams ... streams that supply New York City's reservoirs. (Nitrate is of particular concern because it is a drinking-water pollutant when present in high concentrations.) During her sabbatical, Arthur is analyzing data from that study and, in collaboration with Lovett and Weathers, is setting up new research plots for the project's continuation and expansion.

In the new study, entitled "Effects of an Introduced Pest on the Carbon and Nitrogen Dynamics of a Northern Hardwood Forest", the researchers will be studying a gradient of beech forest plots. The 20 plots will range from least- to most-infected with beech bark disease and also will exhibit the greatest shift to sugar maple. These two tree species, Dr. Arthur explains, differ in the way they process nitrogen: "Beech trees are nitrogen conserving, while sugar maples are profligate with nitrogen". The collaborators hypothesize that considerably more nitrogen can be lost from the soil in sugar maple forests than in beech forests, and that when sugar maples become more dominant more nitrogen can be leached from the soil into streams.

These differences in nitrogen cycling, says Dr. Arthur, can affect the cycling of calcium and magnesium, other important plant nutrients. She is particularly interested in calcium, which tends

continued on page 2



* Dr. Carreiro, who was an IES postdoctoral associate in the early 1990s, is an associate professor at Fordham's Louis Calder Center. An expert in fungal ecology, her role in the Catskill Mountain ecosystem study is to compare the rates of decomposition of beech and maple leaf litter in the presence or absence of additional nitrogen.

Kentucky Scientists, *from page 1*

to be present at higher levels in sugar maple than in beech forest stands.

Since nitrogen can be a vector for loss of calcium from the ecosystem, can increased nitrogen loss lead to greater calcium loss?

And, since Catskill Mountain soils vary considerably in their inherent calcium concentrations, what is the role of site-specific differences in calcium cycling, as compared to the roles played by different tree species? These are some of the questions

Arthur will try to answer as she and her colleagues study the changes in ecosystem function that are an eventual consequence of a community shift in tree species. ●

Robert Paratley: Scientist's Goal Is New Guide to Systematics

"When I was preparing to teach [systematics], recalls Robert Paratley, "I immersed myself in the 1980s while the 1990s were happening. Now I'm catching up on the '90s."

Robert Paratley (in the IES Greenhouse, below) is on scholarly leave at IES from the University of Kentucky's herbarium, where he is curator. He is writing a student guide to plant systematics*, and when he speaks of

what he needs "catching up" on, he is referring to the increasing use of DNA sequencing in plant classification. His book will be a guide to the classification of flowering plants based on this new molecular evidence.

As a graduate student at Cornell University, Paratley studied systematics in the context of ecology and evolutionary biology, which is how he teaches the subject to his own students. Instead of using the typical taxonomy text approach to classification, in his book he plans to make the material more relevant — and more interesting — by using fossil information and evidence from DNA sequencing. In this way, he will create a framework that will help up-and-

coming botanists more easily understand the complicated relationships among flowering plant families. To gather all the material necessary for such a comprehensive new resource, he is spending some of his days at The New York Botanical Garden, doing a literature search of its vast journal collection. He plans to complete a working draft before he returns to the University of Kentucky. "By the time I leave IES," he says, "I will have something that I can distribute to my students through the [university's] bookstore."

Systematists love to collect plants and Paratley is no exception. He regularly visits untouched areas around Kentucky to look for specimens to add to the herbarium collection, whose 50-55,000 plants are predominantly from the state. Here at the Institute, when he isn't working on his book, he is interacting with plant ecologists and — with the arrival of spring — looking forward to spending time out of doors, not only collecting but also sharing his vegetation and botany expertise with IES students and scientists. ●

* * * * *

Mary Arthur and Robert Paratley and their two children, Lucy and Sara, will return to Lexington in mid-July.



LOWNA KELLY

*Systematics is another word for taxonomy, the classification of organisms and the evolutionary relationships among them.

Education Program, March 2000 ...



Certificate Recognition Ceremony: On 9 March, 23 gardening students, 10 landscape design students and two natural science illustration students received certificates from Ms. Susan Conrad, program leader, IES Continuing Education. Before the presentation, Ms. Claire Sawyers, director of the Scott Arboretum of Swarthmore College, spoke on "Celebrating the American Landscape". Shown here in the Institute's Auditorium are some of the IES students and their instructors; also present are Director Gene E. Likens, at the far left; Head of Education Alan Berkowitz, second from left; and Ms. Conrad, second from left in the front row. ●

JOHN A. CONRAD

Ms. Joan Doyle, program leader in ecology education, led 1,025 students through the door to the sugarbush during this spring's "Ecology of Maple Sugaring" program. Forty-one classes came to the Institute from across Dutchess County, N.Y. to learn about the sugar maple and its forest community. ●



LOWNA KELLY

People Who Make a Difference

D'Maris and Fred Mangelsdorf Help IES Meet Its Campaign Goal

On December 31, 1999, the Institute of Ecosystem Studies completed its first major capital campaign, exceeding the \$6 million goal set to support construction of a new laboratory building and establishment of the endowed G. Evelyn Hutchinson Chair in Ecology. Numerous individuals, foundations and corporations contributed generously to the "Campaign for the Institute of Ecosystem Studies" — a gratifying show of support.

D'Maris and Fred Mangelsdorf are among the many who helped IES meet this campaign goal. "Living 'next door' to a place like the Institute of Ecosystem Studies," says Mr. Mangelsdorf, "we have the joy of sharing in the knowledge produced, and of talking with the scientists, and we also have the responsibility to do what we can to ensure the success and longevity of the Institute so that these scientists can continue doing their important research." In 1999, Mr. and Mrs. Mangelsdorf made a commitment to the Institute's ecological research and education programs over the long-term by establishing a charitable remainder unitrust.

Seeds of Mr. Mangelsdorf's interest in the Institute of Ecosystem Studies were sown long before anyone had even conceived of such a facility. It was in the early 1970s, when he was assistant director of the Woods Hole Oceanographic Institution in Massachusetts, that he read a publication by Dr. Gene E. Likens in which the ecologist reported findings arising from his early years of research at the Hubbard Brook Experimental Forest. As an engineer with an appreciation for the scientific method, Mr. Mangelsdorf recalls, "That fine piece of



the new Institute's director, his first thought was, "What great news."

The Institute holds annual breakfast meetings to introduce local business people to its research and education programs, and soon after his retirement in 1994 Mr. Mangelsdorf accompanied a former Texaco colleague to one of these meetings. This, combined with Mrs. Mangelsdorf's long-time involvement with a number of the educational components of the Institute's program, led to their joining the Aldo Leopold Society and attending the society's regular IES science updates. "As we've gotten to know some of the scientists and their research," Mr. Mangelsdorf explains, "we've realized that the quality of the work is unsurpassed."

work, elegantly written, outlined the science," — and here he emphasizes the word 'science': no politics, no advocacy, just good science — "and I was sufficiently impressed to remember the name 'Likens'". Not long after that he was hired by Texaco, where he worked first in the corporation's environmental department in Beacon, then in the supply group in White Plains, and the family moved to Hopewell Junction. In the early 1980s he read about the opening of the Institute of Ecosystem Studies in nearby Millbrook, and, noting that Dr. Likens was

A charitable remainder trust, such as that established by D'Maris and Fred Mangelsdorf, provides income to named beneficiaries during the term of the trust and also has certain tax benefits. Upon termination of the trust, the balance is transferred to one or more charitable organizations, in this case, IES. If you would like information on creating a planned gift to the Institute, contact Ms. Jan Mittan, IES Development Office, at 914-677-5343.

IES Staff Notes

Professor John Lawton, IES adjunct scientist from 1991-1999, has been appointed chief executive of the United Kingdom's Natural Environment Research Council (NERC). NERC is one of the seven research councils that fund and manage research in the UK, and that nation's leading body for research, survey, monitoring and training in the environmental sciences. A population and community ecologist and former director of the NERC Centre for Population Biology, Dr. Lawton has collaborated with Dr. Clive Jones and other IES scientists over the years and was a co-convenor of the 1993 IES Cary Conference, "Linking Species and Ecosystems."

Mr. Paul A. DeBonis (right) has been promoted from maintainer to supervising maintainer, a position recently vacated with the retirement of Mr. Richard Livellara. "IES buildings have to be fully operational and efficient," DeBonis explains, "and they also have to look good." To this end, he works directly with Mr. Chuck Kimberling, IES manager of operations, learning the behind-the-scenes operation of the Institute's mechanical systems and supervising the maintainers and custodial staff. He also continues to contribute his particular talents — especially painting and restoration — to the infinite number of daily tasks necessary to support the Institute's research and education mission. Mr. DeBonis, a resident of Salt Point, N.Y., has worked at the Institute since April 1992.



INSTITUTE OF
ECOSYSTEM STUDIES
Education Program
Box R
Millbrook, New York 12545-0178



Newsletter

Volume 17, Number 2
March - April 2000

Nonprofit Org.
US Postage
PAID
Millbrook, NY
Permit No. 16

Printed on
100% Recycled
Paper

Calendar

CONTINUING EDUCATION

For **spring 2000** program information, or to request a catalogue, call the Continuing Education office at 914-677-9643. Programs during May and June are:

Workshop

May 2: **Lasagna Gardening**

Gardening

May 20: **Annuals with Style**

June 17: **Simply Roses**

Landscape Design

May 13: **Field Measurement for Designers**

Natural Science Illustration

May 20-23: **Pen and Ink II: Plant and Animal Illustration**

June 3: **Words Never Spoken: Botanical Illustrations** by Doris Vanderlipp

June 27-29: **Watercolors in the Garden**

Biology and Earth Science

May 10: **Spring Mushroom**

May 21: **Wild Plant Identification: Late Spring**

June 1 and 8: **Medicinal Weed Walks**

June 3: **Rare and Endangered Plants**

June 10: **Thirty Key Native American Herbs**

June 25: **Grasses**

Crafts and Photography

May 6: **Exploring Environmental Art**

May 13 & 20: **Garden Photography: Seeing the Picture**

Ecological Excursions and Garden Tours

May 21: **Institute for American Indian Studies**

June 3: **Catskill Mountain Ecosystems**

June 10: **Shaker Museum and Martin Van Buren National Historic Site**

June 10: **Preserving the Rural Landscape**

June 24: **"Flowers and Pollinators" and "Skeletons in Action": Special Exhibits at the Bruce Museum of Arts and Science**

June 28: **Mohonk Mountain House Gardens and Grounds: A Behind the Scenes Tour**

Natural Science Book Club

The IES Continuing Education Program sponsors a book club that explores titles in the fields of gardening, natural history, landscape design and environmental science. Open to the public, the gatherings bring together those with dual interests in nature and reading. Free. Call (914) 677-9643 for information.

IES SEMINARS

Free **scientific seminars** are held each Friday from September until May at 11:00 a.m. in the IES Auditorium on Sharon Turnpike (Route 44A).

April 28: **Regional Scale Analysis of Lyme Disease.**

Dr. Thomas Caraco, SUNY-Albany

May 5: **Dynamics of Texas Coastal Plain Forests:**

Inferences from Longitudinal Data. Dr. Paul

Harcombe, Rice University

VOLUNTEER OPPORTUNITIES

Current needs include:

Perennial Garden, Fern Glen: working side-by-side with IES gardeners is a great learning experience!

The Ecology Shop: weekday and weekend visitor orientation and/or customer assistance

Office/Laboratory: word processing, data entry

Call Ms. Su Marcy at 914-677-7641

IES PLANT SALE 2000

Friday, May 19: 10 a.m. - 4 p.m.

Saturday, May 20: 10 a.m. - 4 p.m.

Sunday, May 21: 11 a.m. - 4 p.m.

Perennials ... Native Plants ... Ferns ... Roses and much more

A list of available plants will be posted on the "What's New at IES" page of our Website.

After May 8, find it at:

www.ecostudies.org/welcome/new.html

THE ECOLOGY SHOP

New in the Shop ... floral notecards by Jessie

Salmon, IES Natural Science Illustration student ...

20% off T-shirts, April & May ... **for children ...** felt

earth, flower, and butterfly kits ... Triazole™ puzzles (these are great for adults, too!) with frog, insect and floral designs ... **and in the Plant Room ...** flowering plants, to bring spring into your home ...

Senior Citizens Days: 10% off on Wednesdays

• *Gift Certificates are available* •

GREENHOUSE

The greenhouse is a year-round tropical plant paradise and a site for controlled environmental research. The building is open until 3:30 p.m. with a free permit (see HOURS).

HOURS

Summer hours: April 1 - September 30

Public attractions are open Mon. - Sat., 9 a.m. - 6 p.m. & Sun. 1-5 p.m., with a free permit.

(Note: The Greenhouse closes at 3:30 p.m. daily.)

The Ecology Shop is open Mon.- Fri., 11 a.m. -

5 p.m., Sat. 9 a.m. - 5 p.m. & Sun. 1-5 p.m.

(The shop is closed weekdays from 1-1:30 p.m.)

• *Free permits are required for visitors and are available at The Ecology Shop or the Education Office before 5 p.m. daily.*

MEMBERSHIP

Join the Institute of Ecosystem Studies. Benefits include subscription to the newsletter, member's rate for courses and excursions, a 10% discount on IES Ecology Shop purchases, and participation in a reciprocal admissions program. Individual membership: \$30; family membership: \$40. Call Ms. Laura Corrado in the Membership Office at 914-677-5343.

The Institute's Aldo Leopold Society

In addition to receiving the benefits listed above, members of The Aldo Leopold Society are invited guests at spring and fall IES science updates. Call Ms. Jan Mittan at 677-5343.

TO CONTACT IES ...

... for research, graduate opportunities, library and administration:

Institute of Ecosystem Studies
Box AB

Millbrook NY 12545-0129

Tel: 914-677-5343 • Fax: 914-677-5976

Street address: Plant Science Building,
Sharon Turnpike (Rte. 44A), Millbrook, N.Y.

... for education, general information and The Ecology Shop:

Institute of Ecosystem Studies

Education Program, Box R

Millbrook NY 12545-0178

Tel: 914-677-5359 • Fax: 914-677-6455

The Ecology Shop: 914-677-7649

Street address: Gifford House Visitor and Education
Center, Sharon Turnpike (Rte. 44A), Millbrook, N.Y.

... IES website: www.ecostudies.org

For information on current IES public events and attractions, visit: www.ecostudies.org/welcome/ThisWeek.html.

For garden tips, follow the link to the Perennial Garden Archives.